

## A WELDING PROGRAM BRIEF

### STRUCTURAL WELDING

The intent of this brochure is to provide direction and general welding information including basic code references to owners, engineers and inspectors in the building industry.

Wisconsin's building code requires any structural welding in buildings to be completed by a qualified welder. Every structural welder must be properly registered and carry a valid welder registration card issued by the Department of Safety and Professional Services. These cards must be made available upon request.

To obtain the individual Safety and Professional Services welder registration card, an individual or contractor must first consult with a WI certified weld test conductor. After the consultation, a conductor may assist with welding details, set-up test coupons, complete or arrange weld testing and upon satisfactory test results, provide special documentation for submittal. Renewal of the welder registration requires periodic re-test by a weld test conductor in each welding process every four years.

### APPLICABLE CODE SECTIONS

#### COMMERCIAL BUILDING CODE – SPS-362

**SPS 362.2204** Structural welding. The details of design, workmanship and technique for welding, inspection of welding, and qualifications of welding operators shall conform to the requirements of the specifications listed in IBC sections 2205, 2206, 2207, 2209 and 2210.

#### AMUSEMENT RIDE CODE – SPS 334

**SPS 334.39 Welding.** Welding of structural members and other critical parts of amusement rides shall comply with chs. SPS 360 to 366.

### CREDENTIAL CODE - SPS 305

#### WELDING STANDARDS ADOPTED

**SPS 305.004** Adopts the following standards:

1. AWS D1.1-2010 Steel
2. AWS D1.2-2008 Aluminum
3. AWS D1.3-2008 Sheet Steel
4. AWS D1.6-2007 Stainless

#### STRUCTURAL WELDER RULES

##### **SPS 305.34** Welder Registration Requirements

\*Structural welders shall be qualified in accordance with any adopted standard above.

\*Individuals shall carry Credential and "Evidence of Completion of Welding Tests" cards on person, make cards available immediately upon request and mark welds as required per SPS 305.34(4)

\*Other documents welder might provide:

1. Welding Procedure Specification- WPS
2. Procedure Qualification Record- PQR
3. Welder Performance Qualification-WPQ
4. Welder Continuity Record

\*Procedure to obtain welder registration:

1. Get a welder registration application
2. Consult with a WI weld test conductor
3. Perform weldment of test coupon
4. After satisfactory test, obtain results w/ conductor signature on application forms
5. Return application with applicable form & fee

Note: A list of WI certified weld test conductors is provided on the back of the welder's registration form & available on our website

\*Welder registrations require an initial \$15 application fee and \$35 registration fee with re-test for renewal every 4 years.

#### WELD TEST CONDUCTOR RULES

##### **SPS 305.35** Weld test conductor requirement

\*Process to become a weld test conductor: An individual shall pass a written WI exam before conducting structural weld tests.

1. Written examination - \$20 fee
2. Application \$15 + certification fee \$80
3. Renewal every 4 years

\*Duties may include welding consultation, visual inspection, performance of weld bend / tensile tests, or completion of testing by radiography

\*Maintain welder records for at least 5 years

\*Provide proper documents to welders to obtain welder registration upon satisfactory test results

### WHO IS A CERTIFIED INSPECTOR?

\*Any inspector who holds a valid credential issued by Department of Safety and Professional Services per Chapter SPS 305 and given the authority / responsibility to enforce structural welding requirements.

\*A certified inspector may be employed by any state, county, municipal or contracted authority. Certified inspectors may be building, boiler, elevator, public safety or other local officials.

### WELDING DEFINITIONS

\*Registered Welder – person who holds a valid credential issued by the department under ch SPS 305.34 as a structural welder

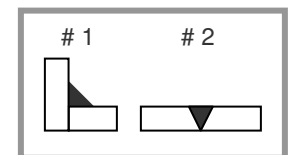
\*Weld Test Conductor – person who holds a valid credential issued by the department under ch SPS 305.35 as a weld test conductor given authority to test structural welders

\*Materials – AWS standard approved

1. Base Metals – metal welded, brazed or cut
2. Filler Metals – metal to be added to a weld

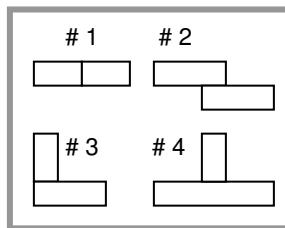
\*Type of Welds

1. Fillet Weld
2. Groove Weld



### \*Weld Joints

1. Butt joint
2. Lap joint
3. Corner joint
4. Tee joint



### \*Welding Process (examples)

1. SMAW – Shield metal arc welding, “stick”
2. FCAW – flux cored arc welding, “flux-core”
3. GMAW - gas metal arc welding, “MIG”
4. GTAW gas tungsten arc welding, “TIG”

### \*Weld Detail

1. Face
2. Root
3. Leg / Toe
4. Throat

See Drawing  
on Brochure  
Front Cover

\*preheat – application of heat immediately prior to welding

\*weld position – welding qualified in flat, vertical horizontal, overhead or combination of positions

\*WPS - welding procedure specification document that is the “recipe” to weld

\*PQR - procedure qualification record verifies by test that WPS does work when followed

\*WPQ - welder performance qualification, proof that welder has ability to produce sound welds. Weld test conductor provides this document.

\*welder registration – credential card issued by the Department of Safety and Professional Services, S & B Division

\*welder symbol – unique ID (mark) assigned to each welder by the employer to identify welds

\*welder continuity – written employer record that verifies that welder has welded at least once every 6 month to assure competency to continuously produce sound welds

## GENERAL INFORMATION

TRY THE SAFETY AND PROFESSIONAL SERVICES WEBSITE

<http://dsps.wi.gov>

(Scroll down left column, Click Safety & Buildings)

- Specific program, “Welding”
- Code Copies, “Chs. SPS 305 and 360-366”
- Inspector maps or informational brochures
- Credential applications
  - Weld Test Conductor (WTC)
  - Welder
- WTC list available on welder application
- Obtain the status of individual credential



## GENERAL ASSISTANCE

\*Try the Safety and Professional Services “Welding Program” website

\*Application, examination or renewals  
Contact Credentials .. **608-261-8500**

\*Welding Program Section Chief, Rick Merkle  
Waukesha Office ..... **262-521-5065**

## TECHNICAL QUESTIONS

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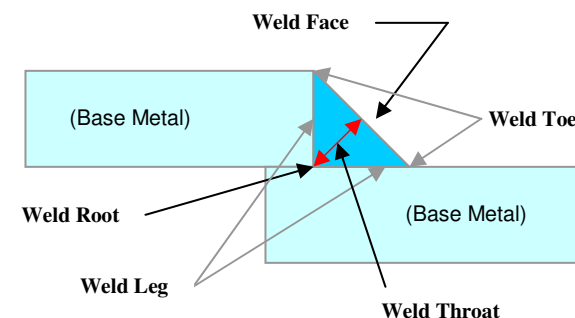
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# STRUCTURAL WELDING

State of Wisconsin

Safety & Buildings Division  
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Madison WI 53703



Details of a Fillet Weld